UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/973,766	12/20/2010	Frederick D. Busche	CHA920050019US2	2427

45095 7590 01/20/2017

HOFFMAN WARNICK LLC
540 Broadway
4th Floor
ALBANY, NY 12207

EXAMINER
NEGIN, RUSSELL SCOTT

ART UNIT	PAPER NUMBER
1631	

NOTIFICATION DATE	DELIVERY MODE
01/20/2017	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOCommunications@hoffmanwarnick.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FREDERICK D. BUSCHE, JOHN B. ROLLINS, HAROLD J. NOYES, and JAMES G. BUSH

Appeal 2015-008057
Application 12/973,766
Technology Center 1600

Before DONALD E. ADAMS, MELANIE L. McCOLLUM, and JEFFREY N. FREDMAN, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

This appeal under 35 U.S.C. § 134(a) involves claims 15–21 (Final Act.[2] 2). Examiner entered rejections under 35 U.S.C. § 101 and 35 U.S.C. § 103(a). We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

STATEMENT OF THE CASE

Appellants disclose "a system and method for preparing near-surface heavy oil for extraction using microbial degradation, as well as an analytical

---

[1] Appellants identify the real party in interest as "International Business Machines Corporation" (App. Br. 1).
[2] Final Office Action entered Dec. 10, 2014.

infrastructure to support the extraction process" (Spec. ¶ 2). Claims 15 is representative and reproduced below:

> 15. A system comprising:
>
> at least one computing device performing a method comprising:
>
> receiving data including: nutrient data, oil property data, rock and fluid property data, and data relating to microbial species residing in an underground, near-surface crude oil extraction environment;
>
> modeling the received data to facilitate *identification of a preferred microbial species* from among the microbial species residing in the underground, near-surface crude oil extraction environment, *wherein the preferred microbial species is a microbial species that can transform heavy oil into a lighter oil*; and
>
> employing an algorithm to identify a nutrient from the underground, near-surface crude oil extraction environment that is introduced into the underground, near-surface crude oil extraction environment to promote a proliferation of the preferred microbial species.

(App. Br. 10 (emphasis added).)

The claims stand rejected as follows:

Claims 15–21 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Larter[3] and Matlock.[4]

Claims 15–21 stand rejected under 35 U.S.C. § 101, as directed to non-statutory subject matter.

---

[3] Larter et al., WO 2005/115649 A1, published Dec. 8, 2005.
[4] Matlock et al., US 5,339,254, issued Aug. 16, 1994.

ISSUE

Obviousness:

Does the preponderance of evidence relied upon by Examiner support a conclusion of obviousness?

FACTUAL FINDINGS (FF)

FF 1. Larter

> provides a *process for stimulating microbial methane production* in a petroleum-bearing subterranean formation, comprising:
>
> (a) analyzing one or more components of the formation to determine characteristics of the formation environment;
>
> (b) detecting the presence of a microbial consortium, comprising *at least one methanogenic microorganism*, within the formation;
>
> (c) assessing whether the formation micr[o]organisms are currently active;
>
> (d) determining whether the microbial consortium comprises one or more *methanotrophic microorganism*;
>
> (e) characterization of one or more microorganisms of the consortium, at least one of the members of the consortium being a *methanogenic microorganism*, and comparing the members of the consortium with at least one known microorganism having one or more known physiological and ecological characteristics;
>
> (f) characterization of one or more methanotrophic microorganisms of the consortium (if present), and comparing the members of the consortium with at least one known microorganism having one or more known physiological and ecological characteristics;
>
> (g) using information obtained from steps (a) through (e) for determining an ecological environment that promotes in situ microbial degradation of petroleum and promotes microbial

> generation of methane by at least one *methanogenic microorganism* of the consortium;
>
> (h) using information obtained from steps (a) and (f), if methanotrophic microorganisms are present, for determining an ecological environment that demotes in situ microbial degradation of methane by at least one *methanotrophic microorganism* of the consortium; and
>
> (i) modifying the formation environment based on the determinations of steps (g) and (h), if *methanotrophic microorganisms are present, to stimulate microbial conversion of petroleums to methane* while minimising methane destruction by adverse processes.

(Larter 6: 18 – 7: 17 (emphasis added); *see generally* Final Act. 5–6.)

FF 2. Larter's process

> stimulates and sustains the activity of a mixture of different microorganisms in a petroleum-bearing, subterranean formation *to convert petroleum to methane*, which can be produced. It also reduces the activity of methanotrophic organisms that may be present, to avoid the degradation of the methane produced and permits avoidance of processes other than methanogenesis that may act as alternative electron sinks and thus prevents methane production. While not wishing to be bound by theory, it is believed that a mixture of microorganisms converts petroleums to methane in multiple acts as follows:
>
> (1) *Microbial consortia degrade various petroleum compounds (e.g., saturated and/or aromatic hydrocarbons, asphaltenic, and nitrogen-sulphur-oxygen bearing organic compounds) into various compounds, which may include amines, alcohols, organic acids, and gases.*
>
> (2) *Methanogens convert various low molecular weight compounds, which may include amines, alcohols, organic acids, and gases, into methane, CO_2, and water.*

(Larter 7: 29 – 8: 14 (emphasis added); *cf.* Final Act 5–6, citing Larter 22: 10–21, ("Larter [] identifies [] preferred syntrophic microbial species (i.e. that are suggested to have the ability of degrading heavy oil into lighter oil)

and Final Act 7, citing Larter 22: 10–21 (Larter discloses "'[p]otential syntrophic organisms that will covert complex organic carbon in petroleum ***into substrates that can be converted to*** methane by methanogens....'"); Ans. 3.)

FF 3. Examiner finds that Larter "at least suggests an intermediate substrate that could comprise less complex forms of carbon (e.g. lighter oil)") (Final Act. 8).

FF 4. Examiner finds that "Larter [] does not teach the computer and data warehouse limitations of [Appellants'] claims" and relies on Matlock to make up for this deficiency in Larter (Final Act. 6).

ANALYSIS

Based on the combination of Larter and Matlock, Examiner concludes that, at the time Appellants' invention was made, it would have been prima facie obvious "to modify the crude oil analysis of Larter [] by use of the computerized analysis of oil of Matlock [] wherein the motivation would have been that automation of the analysis of oil data yields more efficient and expedient data analysis" (Final Act. 7). We are not persuaded.

As Appellants explain, Examiner failed to establish an evidentiary basis on this record to support a conclusion that the combination of Larter and Matlock suggest a system that comprises, *inter alia*, modeling data to facilitate *identification of a preferred microbial species that can transform heavy oil into a lighter oil or promoting the proliferation of the preferred microbial species*, as required by Appellants' claimed invention (*see generally* App. Br. 6–8; Reply Br. 3–4). Specifically, Appellants contend that "Larter describes the production of methane from carbon dioxide and molecular hydrogen, which are 'intermediates' derived from petroleum

hydrocarbons" (Reply Br. 3). "As Appellants previously noted and the Examiner [] emphasizes, these 'intermediate' compounds 'may include amines, alcohols, organic acids and gases.' *Nothing in [Larter] teaches or suggests the transformation of a heavy oil into a lighter oil*" and Matlock fails to make up for this deficiency in Larter (Reply Br. 3 (emphasis added); App. Br. 8). We agree.

On this record, Examiner has, at best, inferred that a microbial species capable of transforming heavy oil into a lighter oil is present in Larter's disclosure, but provides no evidence that this is an inherent or necessary result (*see* Final Act. 5–7; Ans. 3). "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

> Absent some articulated rationale, a finding that a combination of prior art would have been "common sense" or "intuitive" is no different than merely stating the combination "would have been obvious." Such a conclusory assertion with no explanation is inadequate to support a finding that there would have been a motivation to combine.

In re Van Os, 2017 WL 24642, 2015-1975, at *2 (Fed. Cir. Jan. 3, 2017).

CONCLUSION OF LAW

The preponderance of evidence relied upon by Examiner fails to support a conclusion of obviousness. The rejection of claims 15–21 under 35 U.S.C. § 103(a) as unpatentable over the combination of Larter and Matlock is reversed.

Utility:

Does the evidence of record support Examiner's finding that Appellants' claimed invention is directed to non-statutory subject matter?

ANALYSIS

Examiner finds that Appellants' "claimed invention is directed to non-statutory subject matter" (Final Act. 2–3, citing *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014)). Specifically, Examiner finds that Appellants' claimed invention is "directed to the abstract idea of modeling geological data to identify preferred microbial species that degrade oil and to identify nutrients that cause proliferation of the preferred microbial species" (*id.* at 3). According to Examiner, "[t]he additional element(s) or combination of elements in [Appellants'] claim(s) other than the abstract idea per se amount[] to no more than: executing the data manipulation algorithms on a computer system and storing the data on a data warehouse" (*id.*). Therefore, Examiner concludes, that when "[v]iewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amount[] to significantly more than the abstract idea itself" (*id.*; *see also* Ans. 2 (Appellants' "claims are obvious in view of the prior art [relied upon in Examiner's obviousness rejection and] do not recite an improvement"). We are not persuaded.

No doubt, Appellants' claimed system involves the use of a computer that performs a method involving the manipulation of data (*see* App. Br. 10). "[S]imply implementing a mathematical principle on a physical machine, namely a computer, [is] not a patentable application of that principle." *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S.Ct.

1289, 1301 (2012). To the contrary, to transform such a nonpatentable phenomenon, process, or concept into a patent-eligible application, one must do more than simply state the phenomenon, process, or concept "while adding the words 'apply it.'" *Id.* at 1294.

On this record, however, Appellants' claimed invention does more than recite a nonpatentable phenomenon, process, or concept, while simply stating "apply it" in the context of a machine (*see* App. Br. 10).[5] Notwithstanding Examiner's assertion to the contrary, Appellants' claims recite a specific way to automate the identification of nutrients that promote

---

[5] We note that the Application on Appeal is a continuation of Busche et al., (US 7,922,893 B2, issued Apr. 12, 2100). Claim 1 of Busche et al., is reproduced below:

> 1. A method for enhancing the recovery of heavy oil in an underground, near-surface crude oil extraction environment, comprising:
>
> sampling and identifying microbial species (bacteria and/or fungi) that reside in the underground, near-surface crude oil extraction environment;
>
> collecting rock and fluid property data from the underground, near-surface crude oil extraction environment;
>
> collecting nutrient data from the underground, near-surface crude oil extraction environment;
>
> identifying a preferred microbial species from the underground, near-surface crude oil extraction environment that can transform the heavy oil into a lighter oil;
>
> identifying a nutrient from the underground, near-surface crude oil extraction environment that promotes a proliferation of the preferred microbial species; and
>
> introducing the nutrient into the underground, near-surface crude oil extraction environment.

(Busche 8: 35–52.)

the proliferation of preferred microbial species residing in an underground, near-surface crude oil extraction environment that are capable of transforming heavy oil into a lighter oil (*id.*; *see generally* Busche 8: 35–52). *See generally, DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1259 (Fed. Cir. 2014) (The claimed invention "recite[s] a specific way to automate the creation of a composite web page by an 'outsource provider' that incorporates elements from multiple sources in order to solve a problem faced by websites on the Internet").

Further, notwithstanding Examiner's assertion to the contrary, Examiner failed to establish an evidentiary basis on this record to support a finding that "the steps [of Appellants'] claimed [invention] (apart from the natural laws themselves) involve well-understood, routine, conventional activity previously engaged in by researchers in the field." *See Mayo Collaborative Services v. Prometheus Laboratories, Inc.,* 132 S.Ct. 1289, 1301 (2012).

For the foregoing reasons, we agree with Appellants that Appellants' "pending claims [are] directed to patent-eligible subject matter under 35 [U.S.C. §] 101" (App. Br. 6; *see generally id.* at 2–6; Reply Br. 1–3).

CONCLUSION OF LAW

The evidence of record fails to support Examiner's finding that Appellants' claimed invention is directed to non-statutory subject matter. The rejection of claims 15–21 under 35 U.S.C. § 101, as directed to non-statutory subject matter is reversed.

REVERSED